
Coates' Canons Blog: Zapping Zika in North Carolina

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UPDATE: The 2016 Appropriations Act included provisions addressing the Zika virus. For more information, see my post summarizing 2016 public health legislation.

Summer is nearly upon us, and with summer comes mosquitoes. Where there are mosquitoes, there is mosquito-borne illness — a perennial truth that feels more salient than ever this year as the world is facing a public health emergency caused by Zika, the mosquito-borne virus presently responsible for significant outbreaks in South America and the Caribbean. Zika usually causes only mild illness in an infected person, but it has been associated with significant birth defects. There have been clusters of babies born with microcephaly or other neurological disorders in areas where the disease is widespread. This has prompted the World Health Organization to declare Zika a public health emergency of international concern.

Zika has already arrived in the continental United States in the form of infected travelers, but it is not currently spreading through mosquito bites on the mainland. However, the U.S. has mosquitoes that are capable of becoming infected with Zika by biting an infected person, and some of them are present in North Carolina. If a mosquito becomes infected with Zika and then bites more people, the disease could spread. Accordingly, states that have the mosquito types of concern are developing Zika action plans — which gives us the satisfying acronym ZAP (a term I'd love to take credit for but must attribute to the CDC, which held a ZAP summit for state and local public health officials in April).

This post takes a look at North Carolina public health laws and programs that are relevant to responding to the Zika virus in this state.

Zika in the United States

The Centers for Disease Control and Prevention (CDC) is monitoring Zika in the United States. As of May 25, there were 591 lab-confirmed cases in the states, all of which were considered travel-associated, which means the person acquired the disease elsewhere. However, there were another 935 cases in U.S. territories in the Caribbean and Pacific, and most of those were believed to be locally acquired from mosquitoes infected with the Zika virus. There were 12 cases of Zika in North Carolina as of May 25, all of which were travel-associated.

While Zika is primarily transmitted by mosquitoes, there have also been reported cases of sexual transmission. In addition, pregnant women can transmit the virus to their babies.

The public health response to Zika involves both communicable disease control and vector control activities.

Communicable Disease Control and Zika

Illnesses that can be transmitted from human to human via a vector, such as a mosquito, are considered communicable diseases. North Carolina has a legal framework for communicable disease control that includes detecting communicable disease when it occurs in a population, and controlling the spread of disease once it occurs.

Health care providers play a crucial role in detecting Zika and providing the information public health officials need to monitor the spread of the disease. North Carolina public health officials have issued several memos to health care providers, updating them on how to recognize and respond to patients who may have Zika. These memos are sent to health care providers and also published on the North Carolina Division of Public Health's Zika webpage. Because of the

risk to developing fetuses, health care providers are advised to ask all pregnant patients about their recent travel. If a pregnant woman has traveled to an area that has ongoing transmission of Zika, but has not developed symptoms, ultrasound is recommended to determine if the fetus has microcephaly or intracranial calcifications. If a pregnant woman develops symptoms of Zika within two weeks of travel to an affected area, she should be evaluated and also referred for a lab test for the virus.

State law requires health care providers and laboratories to report cases of Zika to public health officials. (I've summarized North Carolina's communicable disease reporting laws here.) Zika was made reportable in North Carolina earlier this spring (10A N.C.A.C. 41A .0101(a)(74)). The reporting requirement is presently effective pursuant to a temporary rule of the Commission for Public Health, and the process to make the rule permanent is underway—a proposed permanent rule is expected to be published in the North Carolina Register tomorrow, on June 1.

When an individual is infected with a communicable disease, there are often control measures that the individual must comply with to avoid spreading the disease to others. I've described the laws about communicable disease control measures in more detail here. At this time, the primary recommendation for individuals who suspect they may be infected is to prevent getting further mosquito bites during the first week of the infection. The public health purpose underlying this recommendation is to keep the disease out of the mosquito population. Because Zika can be spread sexually, individuals with Zika are also advised to refrain from having sexual intercourse or use condoms. The amount of time that Zika may remain present in semen is presently unknown.

Because disease control measures are subject to change as more is learned about a disease, public health personnel and health care providers who need the most current information should consult the websites of the North Carolina Division of Public Health and the CDC.

Vector Control and Zika

Mosquito-borne illness is not new to North Carolina. The state is home to two species of mosquitos—*Aedes aegypti* and *Aedes albopictus*—that are capable of becoming infected with several viruses that are of public health concern, including Zika. Vector control is therefore an important strategy in the state's response to Zika.

According to the CDC, an effective vector control strategy includes the following elements:

- Surveillance — monitoring where the mosquito populations are by finding and mapping their larvae.
- Source reduction — reducing mosquito populations by removing larval habitats, such as containers of standing water.
- Larva control — using biological or chemical treatments to kill larvae before they become adult mosquitoes.
- Control of adult mosquitoes — use of treatments known as adulticides.
- Prevention of human bites — encouraging people to reduce their risk of getting bitten by wearing clothing that covers the skin and using insect repellents.

North Carolina has a long history of recognizing the public health concern that mosquitoes can pose. In 1957, the state established a public health mosquito and vector control program. Among other things, the program made grants to local governments to assist with mosquito control efforts of the types listed above. Between 2010 and 2014, significant budget cuts brought about significant changes in the state's role in vector control. The state public health pest management program was eliminated in 2011. At that time, some aid-to-county funds for mosquito control remained, but by 2014 all state funds for local mosquito control efforts were gone.

Earlier this year, the state Division of Public Health proposed rebuilding the state's capacity to respond to Zika and other vector-borne illnesses through a Vector-borne Disease Management program. The General Assembly appears poised to respond to this recommendation. The most recent version of the state budget bill, which was adopted by the House in May, includes recurring funds for Zika response. The money report associated with the budget bill provides that \$355,000 would be made available as aid-to-county funds. The funding would also provide support for the state to hire medical entomologists to support surveillance and control efforts. *[Update 6/1/2016: The Senate's version of the budget is now available. It also includes recurring funds to support Zika response, including \$177,500 for aid to counties.]*

Individual state residents also have a role to play in keeping mosquitoes out of the environment. North Carolina's "Tip and Toss

" campaign encourages state residents to empty standing water sources at least once a week. Standing water sources found around homes may include garden items such as flower pots or birdbaths, children's wading pools, or buckets or other items that are stored outside. The campaign also recommends keeping gutters clear, and tightly securing screens on rain barrels. Window or door screens should be kept in good repair to keep mosquitoes out of homes and other buildings.

An Ounce of Prevention

What can individuals do to reduce their risk of Zika? At present, there is no vaccine, nor is there a cure (the treatment consists of symptom relief). The primary advice is to avoid getting mosquito bites — which is good advice for all kinds of mosquito-borne illnesses, including quite a few that are already present in North Carolina. The CDC's advice for travelers on preventing bites is available here — but you don't have to travel to heed the advice.

If you are traveling to an affected area, check up-to-date travel information before you go. The CDC's Zika travel page is here. If you are pregnant or trying to become pregnant, the current advice is to avoid travel to affected areas.

Finally, keep your home environment clear of standing water and other mosquito hazards. Here is some more information about how to do that.

Links

- www.ncleg.net/EnactedLegislation/SessionLaws/HTML/2015-2016/SL2016-94.html
- canons.sog.unc.edu/2016-public-health-legislation-highlights/
- www.cdc.gov/ncbddd/birthdefects/microcephaly.html
- www.who.int/mediacentre/news/statements/2016/1st-emergency-committee-zika/en/
- www.cdc.gov/zap/
- epi.publichealth.nc.gov/zika/
- www.sog.unc.edu/resources/microsites/north-carolina-public-health-law/communicable-disease-reporting-reports.oah.state.nc.us/ncac/title%2010a%20-%20health%20and%20human%20services/chapter%2041%20-%20epidemiology%20health/subchapter%20a/10a%20ncac%2041a%20.0101.pdf
- www.ncoah.com/rules/register/
- www.sog.unc.edu/resources/microsites/north-carolina-public-health-law/communicable-disease-control-measures-generally
- www.cdc.gov/chikungunya/pdfs/fs_mosquito_bite_prevention_travelers.pdf
- www.cdc.gov/zika/index.html
- epi.publichealth.nc.gov/cd/vector/VectorborneDiseaseProgramWhitePaper.pdf
- www.ncleg.net/Sessions/2015/Budget/2016/House_Committee_Report_2016-05-18.pdf
- www.ncleg.net/Sessions/2015/Budget/2016/Senate_Committee_Report_2016-05-31.pdf
- www.ncdhhs.gov/news/press-releases/tip-and-toss-8-steps-prevent-mosquito-and-tick-bites-summer
- wwwnc.cdc.gov/travel/page/zika-travel-information
- www.cdc.gov/zika/prevention/controlling-mosquitoes-at-home.html